News and Views

Nobel Prize for Physics

THE formulation of de Broglie's wave-particle theory in 1924 and its experimental verification in 1927 by Dr. C. J. Davisson at New York and Prof. G. P. Thomson at Aberdeen mark an outstanding epoch in the history of physics. With the award of the Nobel Prize for Physics for 1937 to Dr. Davisson and Prof. Thomson just announced, all three are now in the select ranks of Nobel prize winners. The scattering of an electron beam was first studied by Campbell Swinton so far back as 1899, and had it not been for the fact that he used a polycrystalline instead of a single crystal reflecting surface, he might well have discovered the wave-like interaction of electrons with matter. The results of the many further observations on the scattering of electrons were all found to be in accordance with classical or quantum mechanics until, in 1921, Davisson and Kunsman recorded directions of preferential scattering of an electron beam from a polycrystalline surface which, however, they explained in terms of pure particle mechanics. Although L. de Broglie had formulated his theory associating wave systems with moving particles in 1924, it appears to have been rather the stimulus of an accidental observation which led C. J. Davisson and L. H. Germer to study the scattering of slow electrons from the surface of a single nickel crystal, and in March 1927 they gave a preliminary summary of their results. This was followed in December of the same year by a more complete account, which established for the first time the wave properties of moving electrons, in agreement with de Broglie's theory.

MEANWHILE, in Aberdeen, G. P. Thomson and the late A. Reid, unaware of Davisson and Germer's experiments, had been studying the scattering of fast electrons by thin films, and in May 1927 they published an account of the diffraction of cathode rays by a thin film of celluloid, illustrated by a photographic record of the distribution of the scattered electrons. It is interesting to note that here again, although he was acquainted with de Broglie's theory, it was not so much this as certain anomalous results relating to the scattering of electrons in helium observed by Dymond, and Thomson's own experiments on the scattering of positive rays in gases, which afforded the main stimulus to the carrying out of his experiments. Shortly afterwards, Thomson published the results of further experiments on the diffraction of fast electrons by thin metal films which quantitatively confirmed de Broglie's relationship. Since 1928, Davisson and Thomson have, with their respective collaborators, greatly extended their epoch-making researches, and to Thomson is due the merit of having early recognized the outstanding possibilities in the study of surface problems of electron diffraction by fast electrons with photographic recording of the scattering angles. To-day the electron diffraction camera ranks with the microscope, the spectrograph and X-rays as an indispensable unit in the well-equipped chemical or physical laboratory.

Nobel Prize for Chemistry

Prof. W. N. Haworth, of Birmingham, and Prof. Paul Karrer, of Zurich, have been awarded jointly the Nobel Prize for Chemistry for 1937. Prof. Haworth is Director of the Chemistry Laboratories of the University of Birmingham, now provided with the most modern chemistry department in Great Britain through a generous benefactor who has recognized the value and possibilities of Prof. Haworth's investigations. He is a Davy medallist of the Royal Society and Longstaff medallist of the Chemical Society. For many years his name has been associated with outstanding results obtained in his laboratories in the elucidation by chemical and physical methods of the constitution of substances of biochemical importance, particularly the sugars and polysaccharides and, more recently, as the notice of the award indicates, with the synthesis and determination of the constitution of the antiscorbutic vitamin C to which he assigned the name of ascorbic acid. With this later work, other names are also associated, particularly those of Prof. A. Szent-Györgyi, who has received the Nobel Prize for Medicine, and Prof. E. L. Hirst, of Bristol, who has long been associated with Prof. Haworth. Prof. Haworth's name will remain outstanding in classical organic chemistry. The success of his work is due in no small measure to his great ability in organizing and leading a team of loyal collaborators, which calls forth qualities as necessary in modern chemical investigations as those required for carrying out the investigations themselves. Of this loyal collaboration Prof. Haworth has never ceased to express his appreciation whenever he has had occasion to describe the results of investigations in laboratories of which he has had charge.

Prof. Paul Karrer has published many papers on vitamins A and B and related compounds; he also confirmed the constitution ascribed to ascorbic acid by Szent-Györgyi. Karrer is perhaps best known for his investigations on the carotinoids, of which β-carotene acts as the chief precursor of vitamin A in the animal body, although α- and γ-carotene and cryptoxanthine can also act as pro-vitamins to a certain extent. More recently he has turned his attention to vitamin B_2 and the chemistry of the flavins, one of which, lactoflavin, is a part of the complex originally described as vitamin B_2, and also a part of the yellow oxidizing enzyme, in which, as the phosphate, it appears to be combined with the colloidal carrier of the enzyme. Finally, in one of his most recent papers, he and Soloman describe the